

Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

- 1 1 (Currently Amended). An image editing apparatus which edits
- 2 image data which has been coded in accordance with an image coding
- 3 method, wherein a plurality of image frames constituting the image data
- 4 are divided into groups, each image frame is coded into one of a first type
- 5 image frame which is created by coding data in the image frame, a second
- 6 type image frame which is created by performing inter-frame
- 7 mono-directional prediction based on a past image frame and coding a
- 8 difference obtained by the prediction, and a third type image frame which
- 9 is created by performing inter-frame dual-directional prediction based on a
- 10 past image frame and a future image frame and coding differences
- 11 obtained by the prediction, and the plurality of image frames are coded so
- 12 that a head frame of each group may be the first type image frame, said
- 13 apparatus comprising:
- 14 an image ~~coder~~ coder which codes each of frames of image data
- 15 into one of the first type image frame, the second type image frame, and
- 16 the third type image frame;
- 17 an image decoder which decodes the image frame coded by said
- 18 image coder; and
- 19 an image data analyzer which analyzes a picture header of a head
- 20 frame in the area to be edited and determines types of image frames
- 21 included in each group,
- 22 wherein $[[:]]$ said image data analyzer determines whether or not a
- 23 head group which is arranged at a head of an editing target area included in
- 24 the image data is a closed group which does not include the third type
- 25 image frame which is to be decoded by referring to an image frame
- 26 included in a group which is arranged before the head group; and

27 in a case where said image data analyzer determines that the head
28 group is not the closed group, said image coder converts a portion near the
29 head of the editing target area into the closed group.

1 2 (Original). The image editing apparatus according to claim 1, wherein
2 said image data analyzer determines whether or not the third type image
3 frame included in the head group is an image frame which is to be decoded
4 by referring to an image frame included in a group which is arranged
5 before the head group.

1 3 (Original). The image editing apparatus according to claim 2, wherein:
2 in a case where said image data analyzer determines that the third type
3 image frame is to be decoded by referring to an image, frame included in
4 the group arranged before the head group, the image decoder decodes the
5 third type image frame; and
6 said image coder codes the third type image frame which is
7 determined by said image data analyzer as an image frame to be decoded
8 by referring to an image frame included in the group arranged before the
9 head group, and is decoded by said image decoder, into an image frame
10 which is able to be decoded without referring to an image frame included
11 in the group arranged before the head group.

1 4 (Original). The image editing apparatus according to claim 1, wherein:
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 5 (Currently Amended). An image editing apparatus which edits

2 image data which has been coded in accordance with an MPEG method,
3 said apparatus comprising:
4 image data analyzing means for analyzing a picture header of a
5 head frame in the area to be edited and a structure of image frames
6 included in each GOP of the image data, and determining an attribute of
7 each GOP and picture types of image frames included in each GOP;
8 conversion point detecting means for detecting a GOP which needs
9 to be re-coded
10 from an editing target area of the image data, and an image frame which
11 needs to be re-coded from the detected GOP;
12 image decoding means for decoding the image frame which needs
13 to be re-coded detected by said conversion point detecting means;
14 GOP converting means for creating a new GOP by re-coding the
15 image frame decoded by said image expanding means; and
16 image data concatenating means for concatenating a plurality of
17 image data which are cut out as editing target areas,
18 wherein [[:]] said image data analyzing means determines whether
19 or not a head GOP which is arranged at a head of the editing target area is
20 a closed GOP; and
21 in a case where said image data analyzing means determines that
22 the head GOP of the editing target area is not a closed GOP, said GOP
23 converting means converts a portion near the head of the editing target area
24 into a closed GOP.

1 6 (Currently Amended). An image editing apparatus which edits
2 image data which has been coded in accordance with an image coding
3 method, wherein a plurality of image frames constituting the image data
4 are divided into groups, each image frame is coded into one of a first type
5 image frame which is created by coding based on data in the image frame,
6 a second type image frame which is created by performing inter-frame

7 mono-directional prediction based on a past image frame, and a third type
8 image frame which is created by performing inter-frame dual-directional
9 prediction based on a past image frame and a future image frame, and the
10 image data is coded so that a head frame of each group may be the first
11 type image frame, said apparatus comprising:
12 an image encoder which codes each of frames of image data into
13 one of the first type image frame, the second type image frame, and the
14 third type image frame in accordance with said image coding method;
15 an image decoder which decodes the image frame coded by said
16 image encoder; and
17 an image data analyzer which analyzes a picture header of a head
18 frame in the area to be edited and determines types of image frames
19 included in each group,
20 wherein $[[:]]$ in a case where said image data analyzer determines
21 that a head image frame which is arranged at a head of an editing target
22 area included in the image data is not the first type image frame, said
23 image decoder decodes the head image frame, and each image frame
24 appearing between the head image frame and the first type image frame
25 which appears first after the head image frame; and
26 said image encoder re-codes the image frames which are created by
27 decoding the head image frame and each image frame appearing between
28 the head image frame and the first type image frame which appears first
29 after the head image frame, and re-codes the head image frame into the
30 first type image frame, and re-codes any of the third type image frame
31 appearing after the head image frame into an image frame which is able to
32 be decoded without referring to an image frame arranged before the head
33 image frame.

1 7 (Currently Amended). The image editing apparatus ~~according to~~
2 ~~claim 6~~ which edits image data which has been coded in accordance with

3 an image coding method, wherein a plurality of image frames constituting
4 the image data are divided into groups, each image frame is coded into one
5 of a first type image frame which is created by coding based on data in the
6 image frame, a second type image frame which is created by performing
7 inter-frame mono-directional prediction based on a past image frame, and
8 a third type image frame which is created by performing inter-frame
9 dual-directional prediction based on a past image frame and a future image
10 frame, and the image data is coded so that a head frame of each group may
11 be the first type image frame, said apparatus comprising:
12 an image encoder which codes each of frames of image data into
13 one of the first type image frame, the second type image frame, and the
14 third type image frame in accordance with said image coding method;
15 an image decoder which decodes the image frame coded by said
16 image encoder; and
17 an image data analyzer which determines types of image frames
18 included in each group,
19 wherein in a case where said image data analyzer which analyzes a
20 picture header of a head frame in the area to be edited and determines that
21 a head image frame which is arranged at a head of an editing target area
22 included in the image data is not the first type image frame, said image
23 decoder decodes the head image frame, and each image frame appearing
24 between the head image frame and the first type image frame which
25 appears first after the head image frame;
26 said image encoder re-codes the image frames which are created by
27 decoding the head image frame and each image frame appearing between
28 the head image frame and the first type image frame which appears first
29 after the head image frame, and re-codes the head image frame into the
30 first type image frame, and re-codes any of the third type image frame
31 appearing after the head image frame into an image frame which is able to
32 be decoded without referring to an image frame arranged before the head

33 image frame, and wherein:
34 in a case where said image data analyzer determines that the head
35 image frame of the editing target area is not the first type image frame, the
36 image decoder decodes any of ~~the~~ third type image ~~frame~~ frames that
37 ~~appears~~ appear after ~~the~~ a first type image frame which appears first after
38 the head image frame if any of the third type image ~~frame~~ frames is an
39 image frame which is to be decoded by referring to an image frame which
40 is arranged before the first type image frame; and
41 said image encoder re-codes the image frame which is created by
42 decoding any of the third type image frame that appears after the first type
43 image frame which appears first after the head image frame.

1 8 (Original). The image editing apparatus according to claim 6,
2 wherein when said image encoder re-codes the image frames which
3 are created by decoding each frame appearing between the head image
4 frame and the first type image frame which appears first after the head
5 image frame, said image encoder re-codes any of the third type image
6 frame that appears after the head image frame into the third type image
7 frame that is able to be decoded without referring to an image frame which
8 is arranged before the head image frame.

1 9 (Original). The image editing apparatus according to claim 6, wherein:
2 in a case where said image data analyzer determines that the head
3 image frame of the editing target area is the first type image frame, said
4 image decoder decodes any of the third type image frame that appears after
5 the head image frame; and
6 said image encoder re-codes the image frame which is created by
7 decoding any of the third type image frame that appears after the head
8 image frame into an image frame which is able to be decoded without
9 referring to an image frame which is arranged before the head image

10 frame.

1 10 (Original). The image editing apparatus according to claim 6, wherein:
2 in a case where said image data analyzer determines that the head
3 image frame of the editing target area is the first type image frame, said
4 image decoder decodes any of the third type image frame that appears after
5 the head image frame; and
6 said image encoder re-codes the image frame which is created by
7 decoding any of the third type image frame that appears after the head
8 image frame into the first type image frame.

1 11 (Original). The image editing apparatus according to claim 6, wherein:
2 in a case where said image data analyzer determines that the head
3 image frame of the editing target area is the first type image frame, said
4 image decoder decodes any of the third type image frame that appears after
5 the head image frame; and
6 said image encoder re-codes the image frame which is created by
7 decoding any of the third type image frame that appears after the head
8 image frame into the third type image frame which is able to be decoded
9 without referring to an image frame which is arranged before the head
10 image frame.

1 12. The image editing apparatus according to claim 6, wherein
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 13 (Currently Amended). An image editing apparatus which edits image

2 data which has been coded in accordance with an image coding method,
3 wherein a plurality of image frames constituting the image data are divided
4 into groups, each image frame is coded into one of a first type image frame
5 which is created by coding based on data in the image frame, a second type
6 image frame which is created by performing inter-frame mono-directional
7 prediction based on a past image frame, and a third type image frame
8 which is created by performing inter-frame dual-directional prediction
9 based on a past image frame and a future image frame, and the image data
10 is coded so that a head frame of each group may be the first type image
11 frame, said apparatus comprising:

12 an image encoder which codes each of frames of image data into
13 one of the first type image frame, the second type image frame, and the
14 third type image frame in accordance with said image coding method;

15 an image decoder which decodes the image frame coded by said
16 image encoder; and

17 an image data analyzer which analyzes a picture header of a head
18 frame in the area to be edited and determines types of image frames
19 included in each group,

20 wherein $[[\cdot]]$ said image data analyzer determines whether a first
21 condition that the first type image frame which appears first in an editing
22 target area included in the image data coded in accordance with said image
23 coding method is a head image frame which is arranged at a head of a
24 group, and

25 a second condition that the group is a closed group which does not
26 include the third type image frame which is to be decoded by referring to
27 an image frame included in a group which is arranged before the group are
28 satisfied or not; in accordance with a result of determining the first
29 condition and the second condition, said image decoder decodes any of the
30 third type image frame that appears after the first type image frame
31 appearing first in the editing target area and that needs to be re-coded; and

32 said image encoder re-codes the image frame which is created by decoding
33 any of the third type image frame that appears after the first type image
34 frame which appears first in the editing target area.

1 14 (Original). The image editing apparatus according to claim 13, wherein:
2 in a case where said image data analyzer determines that one of the first
3 condition and the second condition is not satisfied, said image decoder
4 decodes any of the third type image frame that appears after the first type
5 image frame which appears first in the editing target area; and
6 said image encoder re-codes the image data which is created by decoding
7 any of the third type image frame that appears after the first type image
8 frame which appears first in the editing target area.

1 15 (Original). The image editing apparatus according to claim 13, wherein:
2 in a case where said image data analyzer determines that the first condition
3 is satisfied and the second condition is not satisfied, said image encoder
4 re-codes the image frame which is created by decoding any of the third
5 type image frame that appears after the first type image frame which
6 appears first in the editing target area into the first type image frame.

1 16 (Original). The image editing apparatus according to claim 13, wherein
2 in a case where said image data analyzer determines that the first condition
3 is satisfied and the second condition is not satisfied, said image encoder
4 re-codes the image frame which is created by decoding any of the third
5 type image frame that appears after the first type image frame which
6 appears first in the editing target area into the third type image frame
7 which is able to be decoded without referring to an image frame which is
8 arranged before the head image frame.

1 17 (Original). The image editing apparatus according to claim 13, wherein

2 in a case where said image data analyzer determines that the first condition
3 and the second condition are satisfied, said image editing apparatus copies
4 the image frame which is created by decoding any of the third type image
5 frame that appears after the first type image frame which appears first in
6 the editing target area to the image data after being edited.

1 18 (Original). The image editing apparatus according to claim 13, wherein
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 19 (Original). An image editing method for editing image data which has
2 been coded in accordance with an image coding method, wherein a
3 plurality of image frames constituting the image data are divided into
4 groups, each image frame is coded into one of a first type image frame
5 which is created by coding based on data in the image frame, a second type
6 image frame which is created by performing inter-frame mono-directional
7 prediction based on a past image frame, and a third type image frame
8 which is created by performing inter-frame dual-directional prediction
9 based on a past image frame and a future image frame, and the plurality of
10 image frames are coded so that a head frame of each group may be the first
11 type image frame, said image editing method comprising:
12 setting an editing target area in the image data which has been
13 coded in accordance with said image coding method;
14 determining whether a head group which is arranged at a head of
15 the editing target area is a closed group which does not include the third
16 type image frame which is to be decoded by referring to an image frame
17 included in a group which is arranged before the head group; and

18 converting a portion near the head of the editing target area into the
19 closed group in a case where said determining determines that the head
20 group is not the closed group.

1 20 (Original). The image editing method according to claim 19, further
2 comprising:
3 determining whether any of the third type image frame included in
4 the head group of the editing target area is an image frame which is to be
5 decoded by referring to an image frame included in a group which is
6 arranged before the head group;
7 decoding any of the third type image frame determined as an image
8 frame which is to be decoded by referring to an image frame included in a
9 group which is arranged before the head group; and
10 coding any of the decoded third type image frame into an image
11 frame which is able to be decoded without referring to an image frame
12 included in a group which is arranged before the head group.

1 21(Original). The image editing method according to claim 19, wherein
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 22 (Original). An image editing method for editing image data which has
2 been coded in accordance with an MPEG method, said image editing
3 method comprising:
4 setting one or more editing target areas in the coded image data;
5 determining whether a head GOP which is arranged at a head of
6 each of the one or 5 more editing target areas is a closed GOP;

7 determining a picture type of a head image frame which is arranged
8 at the head of each editing target area;
9 detecting a GOP which needs to be re-coded, and an image frame
10 which is included in the GOP and needs to be re-coded in accordance with
11 a result of said determining whether a head GOP of each editing target area
12 is a closed GOP, and a result of said determining a picture type of a head
13 image frame of each editing target area; and
14 re-coding the detected image frame which needs to be re-coded,
15 after it is decoded.

1 23 (Original). The image editing method according to claim 22, further
2 comprising:

3 determining a picture type of a next image frame which is arranged
4 next to the head image frame of each editing target area, in a case where
5 said determining whether a head GOP is a closed GOP determines that the
6 head GOP of each editing target area is not a closed GOP;

7 decoding the next image frame and following image frames which
8 are B pictures, in a case where said determining a picture type of a next
9 image frame determines that the next image frame is a B picture, after
10 decoding an image frame which is an I picture which is encountered first
11 when going back in a reverse direction from the head image frame, each
12 image frame between the encountered image frame and the head image
13 frame, and the head image frame;

14 re-coding each decoded image frame, and re-coding the image
15 frames which are created by decoding the following image frames which
16 are B pictures into image frames which are able to be decoded without
17 referring to an image frame which is arranged before the head image
18 frame; and

19 recording each of the image frames which are created by re-coding
20 the head image frame and the following image frames which are B pictures

21 after those image frame are decoded.

1 24 (Original). The image editing method according to claim 22, further
2 comprising:

3 decoding the head image frame of each editing target area in a case
4 where said determining a picture type of a head image frame determines
5 that the head image frame is a P picture, and also decoding each image
6 frame appearing after the head image frame and before an image frame
7 which is an I picture which appears first after the head image frame; and
8 re-coding the image frames which are created by decoding the head
9 image frame and each image frame appearing after the head image frame,
10 and re-coding the image frame which is created by decoding the head
11 image frame into an image frame which is an I picture.

1 25 (Original). The image editing method according to claim 22, further
2 comprising:

3 expanding the image frame which needs to be re-coded by
4 decoding:
5 creating a new GOP by re-coding the image frame which is
6 decoded by said expanding; and
7 concatenating the one or more editing target areas.

1 26 (Original). An image editing method for editing image data which has
2 been coded in accordance with an image coding method, wherein a
3 plurality of image frames constituting the image data are divided into
4 groups, each image frame is coded into one of a first type image frame
5 which is created by coding based on data in the image frame, a second type
6 image frame which is created by performing inter-frame mono-directional
7 prediction based on a past image frame, and a third type image frame
8 which is created by performing inter-frame dual-directional prediction

9 based on a past image frame and a future image frame, and the image data
10 is coded so that a head frame of each group may be the first type image
11 frame, said image editing method comprising:
12 setting an editing target area in the image data which has been
13 coded in accordance with said image coding method;
14 determining a type of a head image frame which is arranged at a
15 head of the editing target area;
16 decoding the head image frame of the editing target area and each
17 image frame appearing between the head image frame and the first type
18 image frame which appears first after the head image frame, in a case
19 where said determining a type determines that the head image frame is not
20 the first type image frame; and
21 re-coding the image frames created by decoding the head image
22 frame and each image frame appearing between the head image frame and
23 the first type image frame which appears first after the head image frame,
24 and re-coding the head image frame into the first type image frame, and
25 re-coding any of the third type image frame that appears after the head
26 image frame into an image frame which is able to be decoded without
27 referring to an image frame which is arranged before the head image
28 frame.

1 27 (Currently Amended). ~~The image editing method according to claim 26~~
2 An image editing method for editing image data which has been coded in
3 accordance with an image coding method, wherein a plurality of image
4 frames constituting the image data are divided into groups, each image
5 frame is coded into one of a first type image frame which is created by
6 coding based on data in the image frame, a second type image frame which
7 is created by performing inter-frame mono-directional prediction based on
8 a past image frame, and a third type image frame which is created by
9 performing inter-frame dual-directional prediction based on a past image

10 frame and a future image frame, and the image data is coded so that a head
11 frame of each group may be the first type image frame, said image editing
12 method comprising:

13 setting an editing target area in the image data which has been
14 coded in accordance with said image coding method;

15 determining a type of a head image frame which is arranged at a
16 head of the editing target area;

17 decoding the head image frame of the editing target area and each
18 image frame appearing between the head image frame and the first type
19 image frame which appears first after the head image frame, in a case
20 where said determining a type determines that the head image frame is not
21 the first type image frame; and

22 re-coding the image frames created by decoding the head image
23 frame and each image frame appearing between the head image frame and
24 the first type image frame which appears first after the head image frame,
25 and re-coding the head image frame into the first type image frame, and
26 re-coding any of the third type image frame that appears after the head
27 image frame into an image frame which is able to be decoded without
28 referring to an image frame which is arranged before the head image
29 frame, and further comprising:

30 decoding any of the third type image frame frames that appears
31 appear after the first type image frame which appears first after the head
32 image frame if any of the third type image frame is an image frame frames
33 which is to be decoded by referring to an image frame which is arranged
34 before the first type image frame, in a case where said determining a type
35 determines that the head image frame of the editing target area is not the
36 first type image frame; and

37 re-coding the image frame which is created by decoding any of the
38 third type image frame that appears after the first type image frame which
39 appears first after the head image frame.

1 28 (Original). The image editing method according to claim 26, further
2 comprising
3 re-coding the image frames created by decoding the head image
4 frame and each image frame appearing between the head image frame and
5 the first type image frame which appears first after the head image frame,
6 and re-coding any of the third type image frame that appears after the head
7 image frame into the third type image frame which is able to be decoded
8 without referring to an image frame which is arranged before the head
9 image frame.

1 29 (Original). The image editing method according to claim 26, further
2 comprising:
3 decoding any of the third type image frame that appears after the
4 head image frame of the editing target area in a case where said
5 determining a type determines that the head image frame is the first type
6 image frame; and
7 re-coding the image frame which is created by decoding any of the
8 third type image frame that appears after the head image frame into an
9 image frame which is able to be decoded without referring to an image
10 frame which is arranged before the head image frame.

1 30 (Original). The image editing method according to claim 26, further
2 comprising:
3 decoding any of the third type image frame that appears after the
4 head image frame of the editing target area in a case where said
5 determining a type determines that the head image frame is the first type
6 image frame; and
7 re-coding the image frame which is created by decoding any of the
8 third type image frame that appears after the head image frame into the
9 first type image frame.

1 31 (Original). The image editing method according to claim 26, further
2 comprising:
3 decoding any of the third type image frame that appears after the
4 head image frame of the editing target area in a case where said
5 determining a type determines that the head image frame is the first type
6 image frame; and
7 re-coding the image frame which is created by decoding any of the
8 third type image frame that appears after the head image frame into the
9 third type image frame which is able to be decoded without referring to an
10 image frame which is arranged before the head image frame.

1 32 (Original). The image editing method according to claim 26, wherein:
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 33 (Original). An image editing method for editing image data which has
2 been coded in accordance with an image coding method, wherein a
3 plurality of image frames constituting the image data are divided into
4 groups, each image frame is coded into one of a first type image frame
5 which is created by coding based on data in the image frame, a second type
6 image frame which is created by performing inter-frame mono-directional
7 prediction based on a past image frame, and a third type image frame
8 which is created by performing inter-frame dual-directional prediction
9 based on a past image frame and a future image frame, and the image data
10 is coded so that a head frame of each group may be the first type image
11 frame, said image editing method comprising:
12 setting an editing target area in the image data which has been

13 coded in accordance with said image coding method;
14 determining whether a first condition that the first type image
15 frame which appears first in the editing target area is a head image frame
16 which is arranged at a head of a group and a second condition that the
17 group is a closed group which does not include the third type image frame
18 which is to be decoded by referring to an image frame included in a group
19 which is arranged before the group are satisfied or not;
20 decoding any of the third type image frame that appears after the
21 first type image frame which appears first in the editing target area and that
22 needs to be re-coded, in accordance with a result of determining the first
23 condition and the second condition; and
24 re-coding the image frame which is created by decoding any of the
25 third type image frame that appears after the first type image frame which
26 appears first in the editing target area.

1 34 (Original). The image editing method according to claim 33, further
2 comprising:
3 decoding any of the third type image frame that appears after the
4 first type image frame which appears first in the editing target area, in a
5 case where said determining determines that one of the first condition and
6 the second condition is not satisfied; and
7 re-coding the image frame which is created by decoding any of the
8 third type image frame that appears after the first type image frame which
9 appears first in the editing target area.

1 35 (Original). The image editing method according to claim 33, further
2 comprising
3 re-coding the image frame which is created by decoding any of the
4 third type image frame that appears after the first type image frame which
5 appears first in the editing target area into the first type image frame, in a

6 case where said determining determines that the first condition is satisfied,
7 and the second condition is not satisfied.

1 36 (Original). The image editing method according to claim 33, further
2 comprising
3 re-coding the image frame which is created by decoding any of the
4 third type image frame that appears after the first type image frame which
5 appears first in the editing target area into the third type image frame
6 which is able to be decoded without referring to an image frame which is
7 arranged before the head image frame, in a case where said determining
8 determines that the first condition is satisfied, and the second condition is
9 not satisfied.

1 37 (Original). The image editing method according to claim 33, further
2 comprising
3 copying the image frame which is created by decoding any of the third type
4 image frame that appears after the first type image frame which appears
5 first in the editing target area to the image data after being edited, in a case
6 where said determining determines that the first condition and the second
7 condition are satisfied.

1 38 (Currently Amended). ~~The image editing method according to claim 33~~
2 An image editing method for editing image data which has been coded in
3 accordance with an image coding method, wherein a plurality of image
4 frames constituting the image data are divided into groups, each image
5 frame is coded into one of a first type image frame which is created by
6 coding based on data in the image frame, a second type image frame which
7 is created by performing inter-frame mono-directional prediction based on
8 a past image frame, and a third type image frame which is created by
9 performing inter-frame dual-directional prediction based on a past image

10 frame and a future image frame, and the image data is coded so that a head
11 frame of each group may be the first type image frame, said image editing
12 method comprising:
13 setting an editing target area in the image data which has been
14 coded in accordance
15 with said image coding method;
16 determining whether a first condition that the first type image
17 frame which appears first in the editing target area is a head image frame
18 which is arranged at a head of a group and a second condition that the
19 group is a closed group which does not include the third type image frame
20 which is to be decoded by referring to an image frame included in a group
21 which is arranged before the group are satisfied or not;
22 decoding any of the third type image frame that appears after the
23 first type image frame which appears first in the editing target area and that
24 needs to be re-coded, in accordance with a result of determining the first
25 condition and the second condition; and
26 re-coding the image frame which is created by decoding any of the
27 third type image frame that appears after the first type image frame which
28 appears first in the editing target area, further comprising
29 inserting a first or second type image frame which appears
30 immediately before a head image frame which is arranged at the head of
31 the editing target area into the head of the editing target area, in a case
32 where the head image frame is the third type image frame.

1 39 (Original). The image editing method according to claim 33, wherein:
2 said image coding method is an MPEG method;
3 each of the groups is a GOP of MPEG;
4 the first type image frame is an I picture;
5 the second type image frame is a P picture; and
6 the third type image frame is a B picture.

1 40 (New). An image editing apparatus which edits image data which has
2 been coded in accordance with an image coding method, wherein a
3 plurality of image frames constituting the image data are divided into
4 groups, each image frame is coded into one of a first type image frame
5 which is created by coding data in the image frame, a second type image
6 frame which is created by performing inter-frame mono-directional
7 prediction based on a past image frame and coding a difference obtained
8 by the prediction, and a third type image frame which is created by
9 performing inter-frame dual directional prediction based on a past image
10 frame and a future image frame and coding differences obtained by the
11 prediction, and the plurality of image frames are coded so that a head
12 frame of each group may be the first type image frame, said apparatus
13 comprising:
14 an image coder which codes each of frames of image data into one
15 of the first type image frame, the second type image frame, and the third
16 type image frame;
17 an image decoder which decodes the image frame coded by the
18 image coder; and
19 an image data analyzer which detects a head group which is
20 arranged at a head of an editing target area included in the image data and
21 determines types of image frames included in each group,
22 wherein: said image data analyzer determines whether or not the
23 head group which is arranged at a head of the editing target area included
24 in the image data is a closed group which does not include the third type
25 image frame which is to be decoded by referring to an image frame
26 included in a group which is arranged before the head group; and
27 in a case where said image data analyzer determined the head group
28 is not the closed group which does not include the third type image frame,
29 said image coder converts a portion near the head of the editing target area

30 into the closed group.

1 41 (New). An image editing apparatus which edits image data which
2 has been coded in accordance with an MPEG method, said apparatus
3 comprising:

4 image data analyzing means for analyzing a structure of image
5 frames included in each GOP of the image data, and determining an
6 attribute of each GOP and picture types of image frames included in each
7 GOP;

8 conversion point detecting means for detecting a GOP which needs
9 to be re-coded from an editing target area of the image data, and an image
10 frame which needs to be re-coded from the detected GOP;

11 image decoding means for decoding the image frame which needs
12 to be re-coded detected by said conversion point detecting means;

13 GOP converting means for creating a new GOP by re-coding the
14 image frame decoded by said image expanding means; and

15 image data concatenating means for concatenating a plurality of
16 image data which are cut out as editing target areas,

17 wherein: said image data analyzing means detects a head GOP
18 which is arranged at a head of the editing target area and determines
19 whether or not the head GOP which is arranged at the head of the editing
20 target area is a closed GOP; and

21 in a case where said image data analyzing means determines that
22 the head GOP of the editing target area is not a closed GOP, said GOP
23 converting means converts a portion near the head of the editing target area
24 into a closed GOP including no B picture.